

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

US EPA RECORDS CENTER REGION 5



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March 27, 1992

TO: Gene Hall, Project Manger  
Site Management Unit 2  
Superfund Section  
Environmental Response Division

FROM: Robert Delaney, Geologist  
Superfund Support Unit  
Geological Services Section  
Environmental Response Division

SUBJECT: Review Comments of the Draft Project Plans for the  
Remedial Investigation and Feasibility Study of the  
Albion-Sheridan Township Landfill, Calhoun County.

I have completed my review of Draft Project Plans for the Albion-Sheridan Township Landfill Remedial Investigation (RI) and Feasibility Study (FS). I have the following comments:

**WORK PLAN**

Section 1.1.5 The list of Data Gaps should include, "The location of clusters of buried drums."

There is evidence that drums of listed hazardous wastes have been buried at the site (see section 1.1.4). There may be discrete areas within the site that contain large numbers of drums. If such areas exist, the remedial options array should include removal of such "hot spots of drums."

Section 2.5.4 The geophysical survey must include as one of its' objectives the location of clusters of drums.

The work plan should include provision to survey suspected drum burial areas, as indicated by the electromagnetic (EM) survey, using a magnetometer.

*how* The magnetometer can confirm the location and quantity of drums.

Section 2.5.6 This comment refers not only to section 2.5.6 of the Work Plan but also sections 2.5.7, 2.5.7.3, and sections 2.4.1 and 2.4.1.3 of the Sampling and Analysis Plan. The consultant has characterized the site geology as 26 to 36 feet of glacial drift over lying the Mississippian aged Marshall

Formation. Groundwater was found about 12 to 26 feet below the ground surface.

The glacial drift consists of mainly sand and gravel with some discontinuous clay and silty clay, layers. The glacial drift supports an aquifer system.

The Marshall Formation consists of sandstones that serve as an important groundwater source to the population in the Albion area. The upper portions of the Marshall Sandstone are known to be fractured in this area of the State.

The two aquifers are thought to be hydraulically connected, although the nature to the connection is unknown. Groundwater in both aquifers is thought to flow to the south to southwest from the site. It is believed that ground water in the shallower portion of the aquifer discharges to the North Branch of the Kalamazoo River.

The implications of this is that under normal conditions any plume created by the landfill will move directly to the North Branch of the Kalamazoo River. The hydrogeologic regime, of course, still needs to be defined and this preliminary conceptualization may prove to be inadequate. However, it is reasonable based upon the available information.

The consultant has designed the overall study upon this conceptualization. There are, however, a few potential problems that must be accounted for. My major concern is that because the landfill is located over and in a sand and gravel aquifer and there was evidently a liquid waste disposal lagoon on the site, a dense nonaqueous phase liquid (DNAPL) may have been created. If chlorinated hydrocarbons were disposed of on site in sufficient quantity, they would have created a DNAPL.

It would be appropriate to vertically sample the water table under, and down gradient of, "hot spots." Such a DNAPL would not follow the "normal" migration path of a contamination plume. It could contaminate lower portions of the Marshall Sandstone. If the Marshall Formation is hydraulically connected to the glacial aquifer and the Marshall is fractured, there is a danger that

*If we could locate the liquid pond, we wouldn't drill through it. We don't know where it is. Define what you mean by vertically sampled. # of wells which would be considered sufficient*

domestic water supplies in the area would eventually become contaminated. The plume might also underflow the river if the plume were deep enough into the Marshall.

For the study to be complete, the investigation must eliminate the possibility of a DNAPL. To do so, the work plan should include wells drilled below "hot spots" and vertically sampled until clean zones are reached. The plan should also include wells drilled down gradient of the "hot spots." These wells will need to be vertically sampled until clean zones are reached.

Section 2.5.7.3, page 2-11 of the work plan, second paragraph should include these provisions.

#### Section 2.5.7.4

The work plan reads, "An in situ hydraulic conductivity test (slug test) will be performed on each monitoring well to determine hydraulic conductivity of the screened interval. The water level in each monitoring well of a cluster will be monitored during testing of adjacent wells to aid in determining the degree of communication between aquifers." It is unlikely that slug tests will "aid in determining the degree of communication between aquifers." Too small of a volume of water is displaced to stress the aquifer.

A pump test would be necessary to determine the degree of communication between aquifer, if it becomes apparent that this is an important issue.

#### Section 2.5.7.5

Field verification of groundwater flow model conclusions is required. As a tool for guiding further remedial investigative work or as a tool to evaluate remedial alternatives it is acceptable.

Computer modeling as proof of hydrogeologic conceptualizations, contaminate movement, and remediation success is not acceptable. This section should better define the objectives of the computer modeling effort.

#### Section 2.12.1

The brief report (memorandum) that is submitted at the end of the Phase I RI should also include: Static water data, well logs of phase I, the

topographic map and additional background research information. The background research information should include at a minimum, residential and municipal well logs, MDNR reports on the area, other pertinent reports that have been prepared on the area, background information on the Marshall Formation, etc.

#### **SAMPLING AND ANALYSIS PLAN**

**Section 1.3** "Areas exist at the site which received industrial wastes (e.g. metallic sludge)" should read "... (e.g. metallic sludge, liquid wastes, drums)."

**Section 2.2** This section should include the location of "hot spots" and buried drums as objectives of the geophysical surveys.

The spacing for the EM work should be 20 foot intervals instead of 50 feet. Twenty foot intervals are standard for this type of work. Ten foot intervals in areas of special concern is recommended.

*why* A magnetometer survey will be needed for areas identified from the EM survey that have high concentrations of metal.

EPA desires to streamline the RI/FS process for this project. It is therefore critical to design a careful, geophysical survey as a screening tool. This will help avoid time consuming duplication of effort and a multiple phase RI.

**Section 2.3.1** Detection limits for field screening with the Hewlett Packard 5890A GC are unacceptably high. Table 1 should be changed to reflect a more realistic detection limit. The manufacturer of the GC should be contacted to determine a realistic detection limit.

**Section 2.4.1.2**

Page 2-6, fourth paragraph reads, "...and no more than 2 samples will be collected from each pit...." It should read, "...and a minimum of one sample but not more than 2 samples will be collected from each pit...."

**Section 2.4.1.3**

See comments above for Section 2.5.6 of the Work Plan.

**Section 2.5.4.3**

What detection limits are expected for the GC scan of ground water. The detection limits shown in Table 1 are unacceptably high.

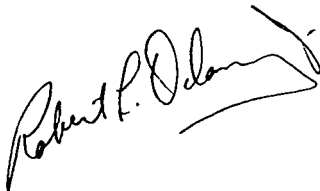
**Figure 7 & 8**

Screen length and sand pack length are not indicated on the monitoring well schematic. See the November 1990 MDNR (draft) Hydrogeologic Study Guidance Document for proper monitoring well construction details.

**Table 1**

Detection limits are unacceptably high.

cc: Jim Heinzman, ERD

A handwritten signature in black ink, appearing to read "Robert L. Olson", with a stylized flourish at the end.